1. INTRODUCTION

Lymphatic filariasis or elephantiasis is a parasitic disease caused by microscopic, thread-like worms, of which have mosquitoes as a vector. It affects over 120 million people in 73 countries throughout the tropics and sub-tropics of Asia, Africa, the Western Pacific, and parts of Central and South America. Ninety percent of these are caused by *Wuchereria bancrofti* and most of the remainder is *Brugia malayi*. In Thailand, lymphatic filariasis is mainly caused by *W. bancrofti* and *B. malayi* (Filariasis Division, 1995). Both nocturnally subperiodic and diurnally subperiodic types have been differentiated (Filariasis Division, 1998). The area of *W. bancrofti* active transmission has now been confined in two Western provinces of Tak, Kanchanaburi and one Northern province of Mae Hong Son, where Myanmar people emigrate to Thailand for job seeking. It is estimated that 2-3% of these migrants carry the nocturnal periodic *W. bancrofti* (Triteeraprapab *et al*., 2001). For *B. malayi*, the endemic areas of nocturnal subperiodic type are located in five provinces of Southern Thailand, namely Nakhon Si Thammarat, Pattalung, Pattani, Yala and Narathiwat, whereas that of diurnal subperiodic type is only in Surat Thani province (Guptavanij *et al*., 1971; Filariasis Division, 1998).

In Thailand, lymphatic filariasis is one of important health problems leading to permanent and long-term disabilities. Patients suffer from pain, disfigurement and sexual disability. Communities frequently shun women and men disfigured by the disease. Many women with visible signs of the disease will never marry or will be rejected by their spouses and families. Affected people frequently are unable to work because of their disabilities.

Remarkable advances in treating lymphatic filariasis have recently been achieved, but most of these have focused on the individual, not on the community with infection. The goal has been to reduce microfilaraemia in a community to levels below which successful transmission of infection will not occur. Treatment with a standard drug, diethylcarbamazine (DEC), is not completely effective in eliminating infection due to, mainly, adverse drug reactions.

B. malayi was found in some animals such as leaf monkey, cat, which may serve as possible reservoirs in disease transmission. A study of Mak *et al*. (1979) showed the presence of *B. malayi* in cats and implied zoonotic filarial transmission in Peninsular Malaysia. Another study conducted in Southern part of Thailand showed that domestic cats in Narathiwat province were infected with nocturnally subperiodic *B. malayi* (Phantana *et al*., 1995; Kanjanopas *et al*., 2001). It was confirmed that *B. malayi* found in human being and cats were similar, based on methods of Giemsa, acid phosphatase stained blood films and PCR technique (Chansiri *et al*., 2002).

Animal reservoirs can affect the lymphatic filariasis control program if there is no appropriate treatment. Since cats are domestic pets of Muslims who are major population in southern provinces, namely Yala, Narathiwat, Pattani. Thus, eradication of *B. malayi* in infected cats should be adjuncted to normal standard strategy to increase efficiency of disease controlling and reduce the transmission from cats to humans via mosquitoes.

Since DEC, which is an available drug for lymphatic filariasis, can cause severe side effects, a newer effective drug, ivermectin becomes more interesting. Over the past decade, several trials have indicated that a single dose of ivermectin was effective for the treatment of human lymphatic filariasis caused by *W. bancrofti* (Kumaraswami *et al*., 1988; Cartel *et al*., 1992). It was

also effective in treating parasitic diseases in several animals such as horse, cattle, pig, sheep and cat. Phantana *et al*. (2002) studied the effect of ivermectin on *B. malayi* infections in domestic cats. Single doses of 200, 400, and 1000 µg/kg of ivermectin given subcutaneously reduced the microfilarial count more than 90% after post-dose. No side effect was observed after treatment. This suggests that ivermectin could be useful in reducing the numbers of microfilariae in *B. malayi*-infected cats in the endemic areas.

However, the information about how ivermectin kinetically behaves in cats is unknown. Pharmacokinetic data of this drug in other kinds of animals can not be applied due to large variation among different species. Thus, pharmacokinetics of ivermectin in cats should be investigated. In the present study, the aim is mainly to study pharmacokinetics of ivermectin in normal cats. To support use of this drug in the lymphatic filariasis endemic areas, the aim is also to perform a preliminary study of pharmacokinetics of this drug in a *B. malayi*-infectd cat. In addition, its efficacy in reducing the blood microfilariae is investigated simultaneously.